UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/730,136	12/09/2003	Mariko Matsumoto	NEG-325US	3191

21254 7590 06/08/2009

MCGINN INTELLECTUAL PROPERTY LAW GROUP, PLLC
8321 OLD COURTHOUSE ROAD
SUITE 200
VIENNA, VA 22182-3817

EXAMINER	
ODOM, CURTIS B	

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
06/08/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/730,136	MATSUMOTO, MARIKO	
	Examiner	Art Unit	
	CURTIS B. ODOM	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 March 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 2, 5, 7, 8, 13, 15, 25, 26, 29, 31, 32, 37, 39, and 51-53* is/are rejected.

7)☒ Claim(s) *3,4,6,9-12,14,16-24,27,28,30,33-36,38 and 40-50* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 3/19/2009 have been fully considered but they are not persuasive. In response to applicant's argument that neither Payne nor Iwamatsu is directed to the problem of estimating a threshold value (see pages 31-32 of the Remarks), a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. Though the invention of Payne, may involve distortion compensation, the prior art structure of Payne is capable of performing the intended use of estimating a threshold, and thus meets the limitations of the rejected claims. As previously discussed, Payne (US 2002/0122504) discloses estimating a threshold by presupposing in which one of multiple levels can be a level of a received data signal (see section 0022, wherein the presupposed levels are four mean threshold levels L_{11}, L_{01}, etc.) and setting up a plurality of threshold values assumed (P_1, P_2, etc.) in association with the presupposition, updating sequentially the assumed thresholds based on the received signal (see section 0023); and selecting an ultimate threshold from the plural assumed threshold based on preceding bits (see sections 0020 and 0033).

The Applicant further states (see pages 31-32 of the Remarks) **"In response, Applicant respectfully submits that the fundamental flaw in the Examiner's position is that mechanism in Payne upon which the Examiner relies is actually oriented toward the**

purpose of compensating a threshold that has already been determined using another mechanism unrelated to the claimed mechanism (e.g., see paragraph [0021]). Thus, the mechanism in Payne is not directed to estimating a threshold value, as required by the claim, using the claimed mechanism of presupposing a value and then selecting an ultimate value to use as the threshold. The process in Payne upon which the Examiner is, at best, a compensation mechanism for the threshold that is already determined. There is no suggestion in Payne to use this compensation mechanism as a mechanism to estimate a threshold, one of which will be ultimately selected.

Finally, it is noted that the rejection currently of record fails to provide a rationale why one having ordinary skill in the art would even want to modify the threshold determination method that is expressly described in paragraph [0021] of primary reference Payne in accordance with the mechanism described in the claims. The simple mechanism of using two previous bits (e.g., paragraph [0021]) to determine the present threshold level is clearly not a substitute for the mechanism described in the independent claim, and the simple mechanism of Payne will certainly not be improved by substituting the mechanism described by the independent claim.

However, it is the understanding of the Examiner that the claims actually recite "**a compensation mechanism for the threshold that is already determined.**" For example claim 1, recites " **presupposing in which one of multiple levels can be a level of a received data signal and setting up a plurality of threshold values assumed (referred to herein as 'assumed threshold values') in association with said presupposition**." It is the understanding of the Examiner that this limitation predetermines a threshold value. The claim further recites

"updating sequentially the assumed threshold values based on the received data". To the understanding of the Examiner, this step updates (compensates) assumed thresholds which have already been determined. Therefore, it is the understanding of the Examiner that the claims as recited recite a threshold estimation method/device which predetermines (assumed) thresholds, updates the predetermined thresholds and selects one of the predetermined thresholds. Prior art reference Payne meets these limitations. Payne discloses estimating a threshold value by presupposing (predefining or predetermining) in which one of multiple levels can be a level of a received data signal (see section 0022, wherein the presupposed levels are four mean threshold levels L_{11}, L_{01}, etc.) and setting up a plurality of threshold values assumed (P_1, P_2, etc.) in association with the presupposition, updating/compensating sequentially the assumed thresholds based on the received signal (see section 0023); and selecting an ultimate threshold from the plural assumed threshold based on preceding bits (see sections 0020 and 0033). Therefore, it is the understanding of the Examiner Payne discloses the limitations as recited in claims.

Finally, the Examiner is not modifying the threshold determination method that is expressly described in paragraph [0021] of primary reference Payne in accordance with the mechanism described in the claims. The prior art reference Payne provides a structure which is capable of performing the intended use of threshold estimations and as shown in the following rejection, meets the limitations of the claims.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 2, 5, 7, 8, 13, 15, 25, 26, 29, 31, 32, 37, 39, and 51-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Payne et al. (previously cited in Office Action 6/16/2008) in view of Iwamatsu et al. (previously cited in Office Action 6/16/2008).

Regarding claim 1, Payne et al. discloses a method for estimating a threshold value in deciding data along an amplitude by a terminal performing wireless communication with a wireless station in accordance with a multi-level signal, the method comprising executing a sequence of instructions in the terminal for:

presupposing (see section 0022, wherein the presupposed levels are four mean threshold levels L_{11}, L_{01}, etc.) in which one of multiple levels can be the level of a received data signal and setting up a plurality of threshold values (see section 0022) assumed in association with the presupposition, the received data being transmitted without a synchronization signal along an amplitude direction (wherein Payne does not disclose a synchronization signal);

updating (see section 0023) sequentially (by only updating the selected threshold) the assumed threshold values based on the bit decisions of the received data (see sections 0034-0036); and

selecting (see section 0020) an ultimate threshold value from the plural assumed threshold values.

Payne et al. does not disclose the multilevel signal is a QAM signal. However, Iwamatsu et al. discloses estimating threshold values of multilevel QAM signals (see section 0009) including presupposing multiple conventional threshold levels (see sections 0072 and 0078) and updating these threshold levels based on received data (see sections 0078, 0090 and 0111). Therefore, it would have been obvious to implement the multilevel threshold estimation method of Payne et al. into a multilevel QAM threshold estimation as described by Iwamatsu et al. since Payne et al. states this threshold estimation method compensates for ISI (section 0008).

Regarding claim 2, Payne et al. discloses selecting the optimum threshold based on the occurrence of bits with respect to the respective threshold levels partitioned based on an eye pattern (see Fig. 2 and Fig. 3, section 0027).

Regarding claim 5, Payne et al. discloses selecting an optimum threshold with a smaller closest path difference of calculated average data levels from the respective received data (see section 0027).

Regarding claim 7, Payne et al. discloses presuming data position levels for the totality of plural assumed threshold values (see section 0034-0036), from one received data to another, and calculating the totality of the assumed threshold values as described in sections 0034-0036.

Regarding claim 8, Payne et al. discloses detection which level the received data belongs (see section 0027) and wherein at least some of the plural assumed thresholds are not updated each time (see section 0023), wherein only the selected threshold is updated.

Regarding claim 13, Payne et al. discloses the updating is terminated after 1500 bits (see section 0034 and selecting one of the plural assumed thresholds (see section 0020).

Regarding claim 15, Iwamatsu et al. discloses deciding which assumed threshold is correct based on an error (difference) between the received data and the received data with respect to the assumed threshold (see section 0114-0115). This threshold is assumed to be correct and the output of the discriminator/demodulator using the correct threshold is output. Therefore, it would have been obvious to include this feature since Iwamatsu et al. states this feature compensates for distortion (see section 0115).

Regarding claim 25, Payne et al. discloses a terminal apparatus (Fig. 1) performing wireless communication with a wireless station in accordance with a multi-level modulation, the terminal apparatus comprising:

an amplitude synchronization detection (Fig. 1, block 36, section 0022) unit for estimating a threshold value for deciding data along an amplitude; and

an amplitude demodulating unit (Fig. 1, block 26) for effecting amplitude demodulation using the threshold value;

the amplitude synchronization detection unit including:

a setup unit (Fig. 1, block 36, section 0020 and 0022) presupposing which level the received data signal may belong to (wherein the presupposed levels are four mean threshold

levels L_{11}, L_{01}, etc.) and for setting up a plural number of threshold values that may be assumed in association with the presupposition;

a update unit (Fig. 1, blocks 40-43, see sections 0023 and 0034-0036) sequentially updating the assumed threshold values based on the received data signal bit decision; and

a selection unit (Fig. 1, block 28, section 0020) selecting an ultimate threshold value from the plural assumed threshold values.

Payne et al. does not disclose the multilevel modulation signal is a QAM signal. However, Iwamatsu et al. discloses estimating threshold values of multilevel QAM signals (see section 0009) including presupposing multiple conventional threshold levels (see sections 0072 and 0078) and updating these threshold levels based on received data (see sections 0078, 0090 and 0111). Therefore, it would have been obvious to implement the multilevel threshold estimation method/apparatus of Payne et al. into a multilevel QAM threshold estimation as described by Iwamatsu et al. since Payne et al. states this threshold estimation method/apparatus compensates for ISI (section 0008).

Regarding claim 26, Payne et al. discloses selecting the optimum threshold based on the occurrence of bits with respect to the respective threshold levels dividing a signal space based on an eye pattern (see Fig. 2 and Fig. 3, section 0027).

Regarding claim 29, Payne et al. discloses selecting an optimum threshold with a smaller closest path difference of calculated average data levels from the respective received data (see section 0027).

Regarding claim 31, Payne et al. discloses presuming data position levels for the totality of plural assumed threshold values (see section 0034-0036), from one received data to another, and calculating the totality of the assumed threshold values as described in sections 0034-0036.

Regarding claim 32, Payne et al. discloses detection which level the received data belongs (see section 0027) and wherein at least some of the plural assumed thresholds are not updated each time (see section 0023), wherein only the selected threshold is updated.

Regarding claim 37, Payne et al. discloses the updating is terminated after 1500 bits (see section 0034 and selecting one of the plural assumed thresholds (see section 0020).

Regarding claim 39, Iwamatsu et al. discloses deciding which assumed threshold is correct based on an error (difference) between the received data and the received data with respect to the assumed threshold (see section 0114-0115). This threshold is assumed to be correct and the output of the discriminator/demodulator using the correct threshold is output. Therefore, it would have been obvious to include this feature since Iwamatsu et al. states this feature compensates for distortion (see section 0115).

Regarding claim 51, Iwamatsu et al. further discloses a base station (see Fig. 1) in communication with a mobile radio (as disclosed in section 0004) using multilevel QAM. It would have been obvious to implement the multilevel threshold estimation method/apparatus of Payne et al. into a multilevel QAM communication system as described by Iwamatsu et al. since Payne et al. states this threshold estimation method/apparatus compensates for ISI (section 0008).

Regarding claims 52 and 53, Payne and Iwamatsu disclose all the limitation of claims 52 and 53 (see rejections of claims 1 and 25). Iwamatsu further discloses a mobile station (see

section 0004) apart of a radio/cellular communication system communicating with a base station (as shown in Fig. 1) using QAM across a high-speed channel for large capacity data transmission (see section 0006). Therefore, it would have been obvious to implement the multilevel threshold estimation method/apparatus of Payne et al. into a multilevel QAM system as described by Iwamatsu et al. since Payne et al. states this threshold estimation method/apparatus compensates for ISI (section 0008).

Allowable Subject Matter

5. Claims 3, 4, 6, 9-12, 14, 16-24, 27, 28, 30, 33-36, 38, and 40-50 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CURTIS B. ODOM whose telephone number is (571)272-3046. The examiner can normally be reached on Monday- Friday, 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Curtis B. Odom/
Primary Examiner, Art Unit 2611
June 6, 2009